

REMARKS

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Claims 15 and 16 have been withdrawn by the Examiner.

Claim 19 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Claim 19 is rejected under 35 U.S.C. § 112 second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Griepentrog et al. (GB 2 050 6798) in view of Nathenson et al. (US 4,842,054). Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Griepentrog et al. and Nathenson et al. in view of Naito et al. (US 4,714,593). Claim 19 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Griepentrol et al. in view of Nathenson et al. and Sasayama et al. (US 2001/0037652).

1. The Applicant traverses the withdrawal of claims 15 and 16 on the ground that they are directed to a non elected invention. In the first Official Action, it was required to choose between:

- Species 1: single secondary circuit 9 only ([0068], fig 1),
- Species 2: secondary circuit 9 and 9' forming bypass circuit ([0068], fig 1).

Reference was made in the Action to section [0068] of the application, which describes that the secondary circuit can include a bypass pipe around heat exchanger 16, for feeding a heat exchanger 30 at moderate temperature. The Applicant elected Species 1.

The bypasses referred to in claims 15 and 16 do not correspond to line 9'. They feed heat exchangers 13a and 13b, as explained in sections [0042] to [0044] of the application and

illustrated on figure 1. The Examiner in the first official action did not give any indication that lines feeding heat exchanger 13a and 13b had to be considered in the same way as line 9'. The Examiner did not refer to sections [0042] to [0044] when defining Species 1 and 2, but only to section [0068]. Bypass circuit 9' was mentioned explicitly, but the lines feeding exchangers 13a/13b were not mentioned at all. There was no way for the Applicant at that time to guess that by electing Species 1, he elected a device with no circuits feeding exchangers 13a and 13b. If the Applicant had known at that time what the Examiner really meant, he may have chosen Species 2 instead of Species 1.

Furthermore, having a bypass line 9' or not comes down to having heat exchanger 30 at moderate temperature or not. Having lines feeding exchangers 13a and 13b or not comes down to having steam turbines 3b and 3c or not. These technical options (having exchanger 30 or not; having steam turbines 3a/3b or not) are disconnected questions, and there are no reasons to address them in a single election requirement.

For the reasons above, the Applicant thinks that the Examiner should have issued two different election requirements, one for having line 9' or not, and one for having lines feeding heat exchangers 13a/13b or not.

2. Claim 5 is considered patentable according to the following reasons.

Regarding the motivation to includes the teaching of Nathenson et al in the device of Griepentrog (GB 2 050 679), the Examiner indicates on page 6 of the Action that it derives from the teaching of Nathenson that the electrical efficiency improves when the temperature in the secondary circuit decreases. In the remarks filed on February 26, 2007, the Applicant indicated that the statement was true in the case of Nathenson because the primary circuit includes a electromagnetic pump coupled to a heat exchanger (flow coupler), but was not applicable to Griepentrog (GB 2 050 679), which has no flow coupler. Column 2, lines 62 to 64 of Nathenson indicate that a decrease of the temperature results in an increased electrical efficiency of the flow coupler.

On page 22 of the action, the Examiner states that Griepentrog (US 4.231.226) teaches that, in the art of thermal power engine with helium and/or nitrogen, it is advantageous for efficiency to have at least three cycles. However, the section cited by the Examiner col 2 line 67 to col 3 line 5 indicates only that the apparatus has three heat exchangers for the cooling of the power cycle. When considering figure 1, it appears that the three heat exchangers 3, 4 and 6 are related to the same cycle 2 and do not correspond to three different cycles as in the invention. Griepentrog (US 4.231.226) teaches at most that implementing three heat exchangers along the secondary circuit of Griepentrog (GB 2 050 679) improves efficiency. It cannot teach that adding a third circuit to the device of Griepentrog (GB 2 050 679) improves efficiency.

Furthermore, it should be highlighted that the secondary circuit of Griepentrog (GB 2 050 679) has four heat exchangers (12, 13, 15 and 17), the temperature of the gas at the coldest point (downstream exchanger 13) being 20°C (293°K). It is not technically feasible to lower significantly the temperature of the gas in the secondary circuit of Griepentrog (GB 2 050 679) downstream exchange 13. If possible at all, the temperature would be lowered only by a few °C and it would not affect the efficiency of the cycle. The cycle of Griepentrog (GB 2 050 679) is already optimized in this regard.

Thus, Griepentrog (US 4.231.226) does not teach that adding a third circuit to the device of Griepentrog (GB 2 050 679) improves efficiency. Furthermore, it is not technically feasible to improve the efficiency of the device of Griepentrog (GB 2 050 679) by lowering the temperature of the secondary gas, as suggested by the Examiner.

3. Regarding the rejection of claim 19 under 35 USC 112, the Applicant submits that it is not impossible for the secondary circuit to be completely closed and to have a pressure equalizing valve continuously equalizing the respective pressures of the primary circuit and the secondary portion of the intermediate heat exchanger. As explained in section [0067] of the disclosure, the pressure equalizing valve has a chamber separated in two portions by a piston, one portion being connected to the primary circuit and the other to the secondary circuit. Equalization is achieved by moving the piston. The statement that the secondary circuit is completely closed means that no gas is exchanged between the primary and secondary circuits

through the pressure equalizing valve. The Applicant is ready to remove the feature “the secondary circuit is entirely closed” from claim 19 if the Examiner requires it.

4. Regarding the rejection of claim 11 under 35 USC 103, the Applicant submits that claim 11 has been amended to remove the claim language “used to”. Claim 11 includes now “... a moderate temperature heat exchanger having ... a secondary portion connected to a fourth circuit different from the primary, secondary and tertiary circuits.” Heat exchangers 6 in Griepentrog (GB2 050 679) and 16 or 24 in Nathenson do not have said secondary portion connected to a fourth circuit different from the primary, secondary and tertiary circuits.

For the reasons set forth above in connection with the rejection of claims 5 and 11 on the basis of prior art, similar rationale exists for the allowance of claims 17 and 18.

5. Regarding the rejection of claim 19 under 35 USC 103, the Applicant submits that valve 14 of Sasayama is not a pressure equalizing valve. There is no indication in Sasayama that valve 14 makes the pressure between circuit 11 and circuit 12 continuously equal to each other.

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

The Director is hereby authorized to charge any fees, or credit any overpayment, associated with this communication, including any extension fees, to CBLH Deposit Account No. 22-0185, under Order No. 20513-00607-US from which the undersigned is authorized to draw.

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Respectfully submitted,

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